

# **Citizen Science: An innovative tool for biodiversity conservation and management !**

Yogani Govender

EPA-Puerto Rico 2014

para la  
Naturaleza

Una nueva unidad del Fideicomiso de Conservación  
diseñada para conectar a la gente con la naturaleza.



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Naturaleza**





# GOALS

- **CONSERVING**
- **INSPIRING STEWARDS**
- **PROMOTING POLICIES FOR CONSERVATION**

*Puerto Rico Brilla Naturalmente*  
reduce el impacto de la contaminación lumínica

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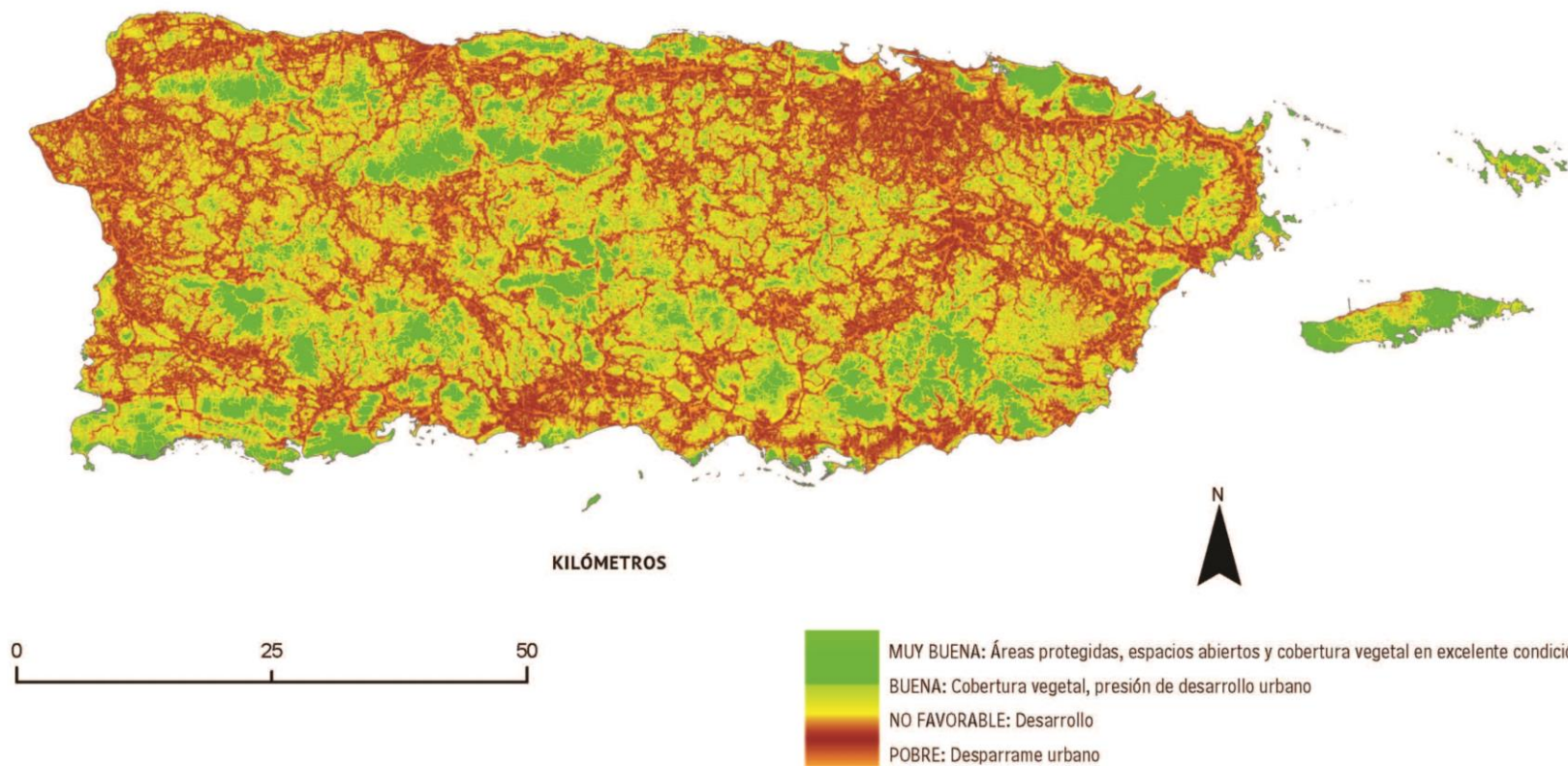
Nuestra meta es preservar el 33%  
de nuestras islas para el 2033.

33%

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# Challenges

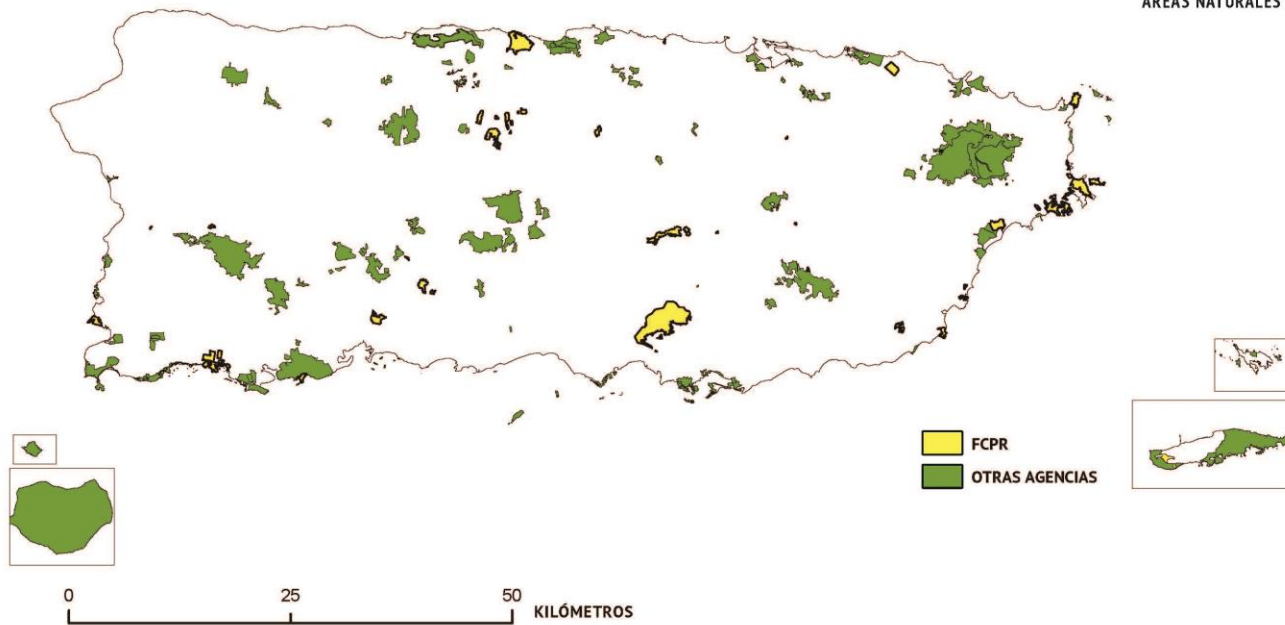




## LANDSCAPE CONDITION

## Áreas Naturales Protegidas

**8%**  
ÁREAS NATURALES PROTEGIDAS

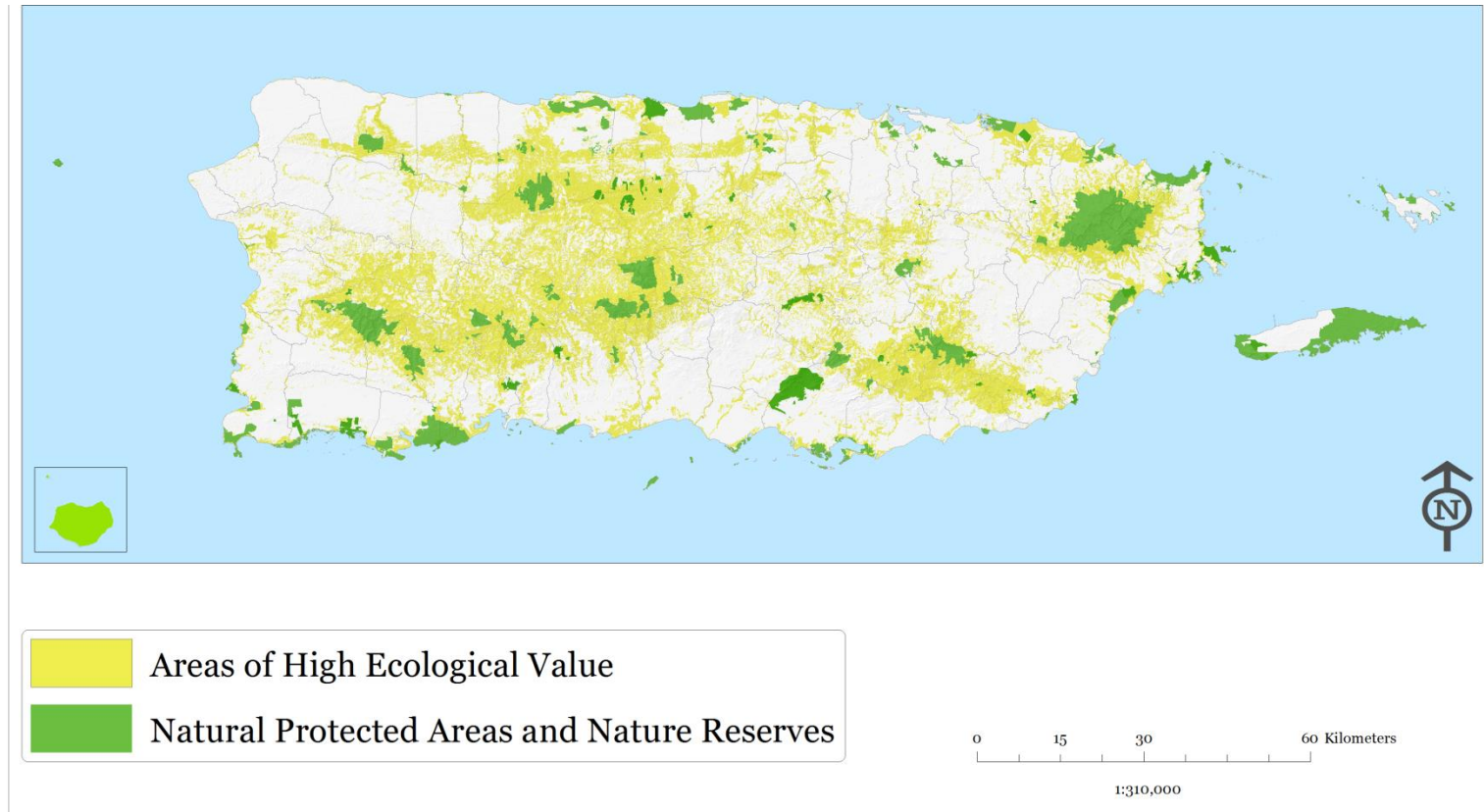


**CONSERVED LANDS**

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# VISION: 33 % by 2033



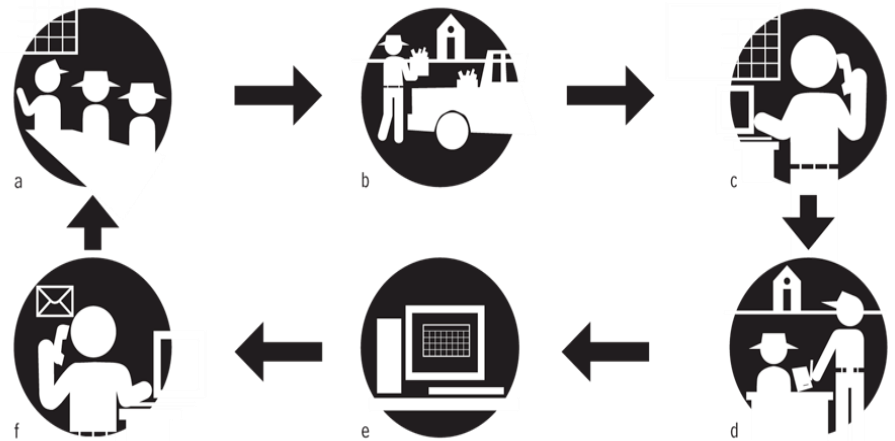


# CITIZEN SCIENCE

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# Citizen Science Model

- a) Planning and design scientific protocols with researchers, state and federal agencies
- b) Developing calendar of field activities
- c) Recruiting Volunteer for Citizen Science Projects
- d) Collecting Data
- e) Data Entry
- f) Thanks and Communicating Results





# Citizen Science Projects

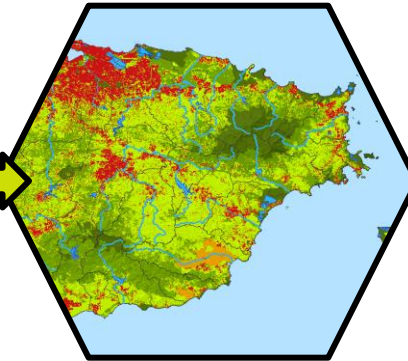
- Private Sector Funding Map of Life Program
- Cornell University E-Bird Program
- National Science Foundation ISE project
- Fish and Wildlife Services Crested Toad Monitoring Program
- American Forest Big Tree Program (IITF)



# Mapa de Vida



**FIELD VALIDATION  
&  
DATA COLLECTION**



**RESEARCH &  
MODELING**

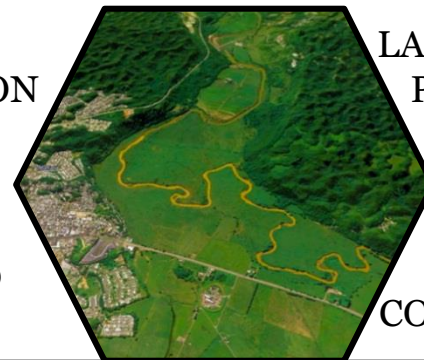
**OUTREACH,  
EDUCATION &  
AWARENESS**

**ACTIVE  
PARTICIPATION**



**STRATEGIC  
CONSERVATION**

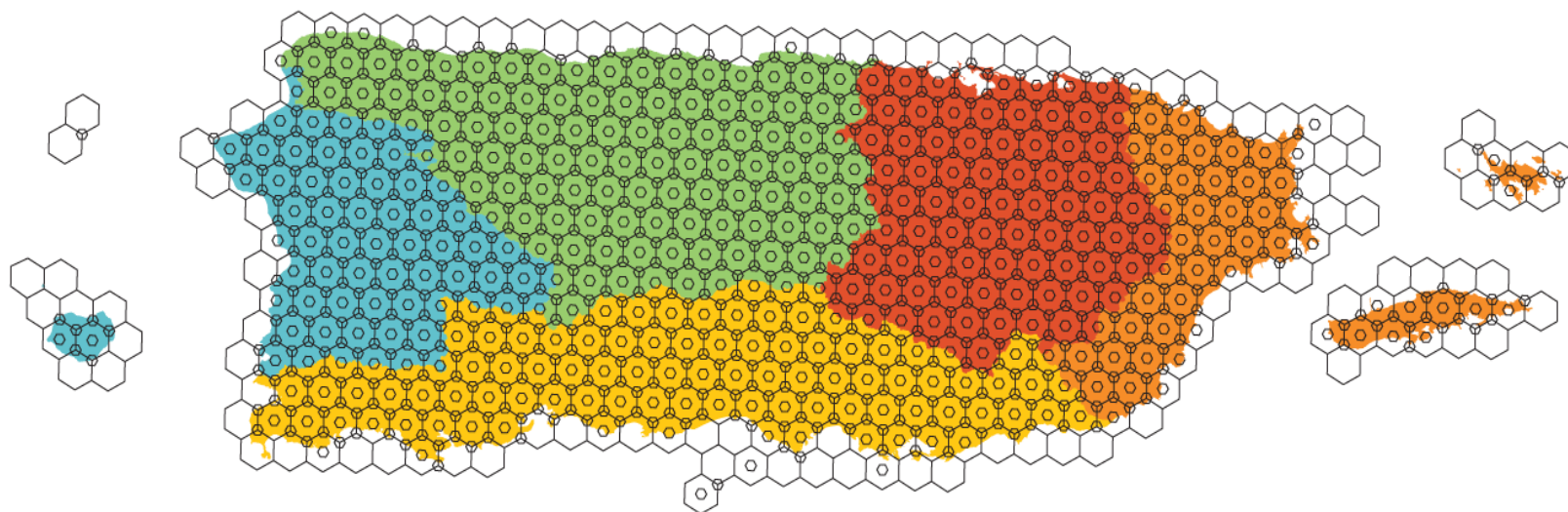
**NATURAL  
PROTECTED  
AREAS**



**LAND USE  
PLANS**

**POLICIES  
FOR  
CONSERVATION**

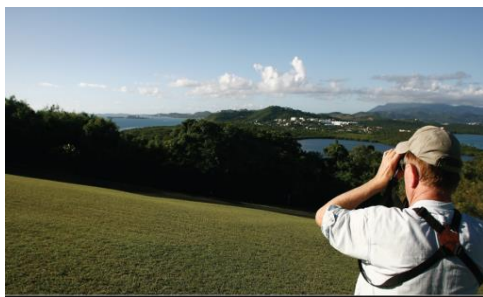




## DESARROLLO DE UNA VISIÓN

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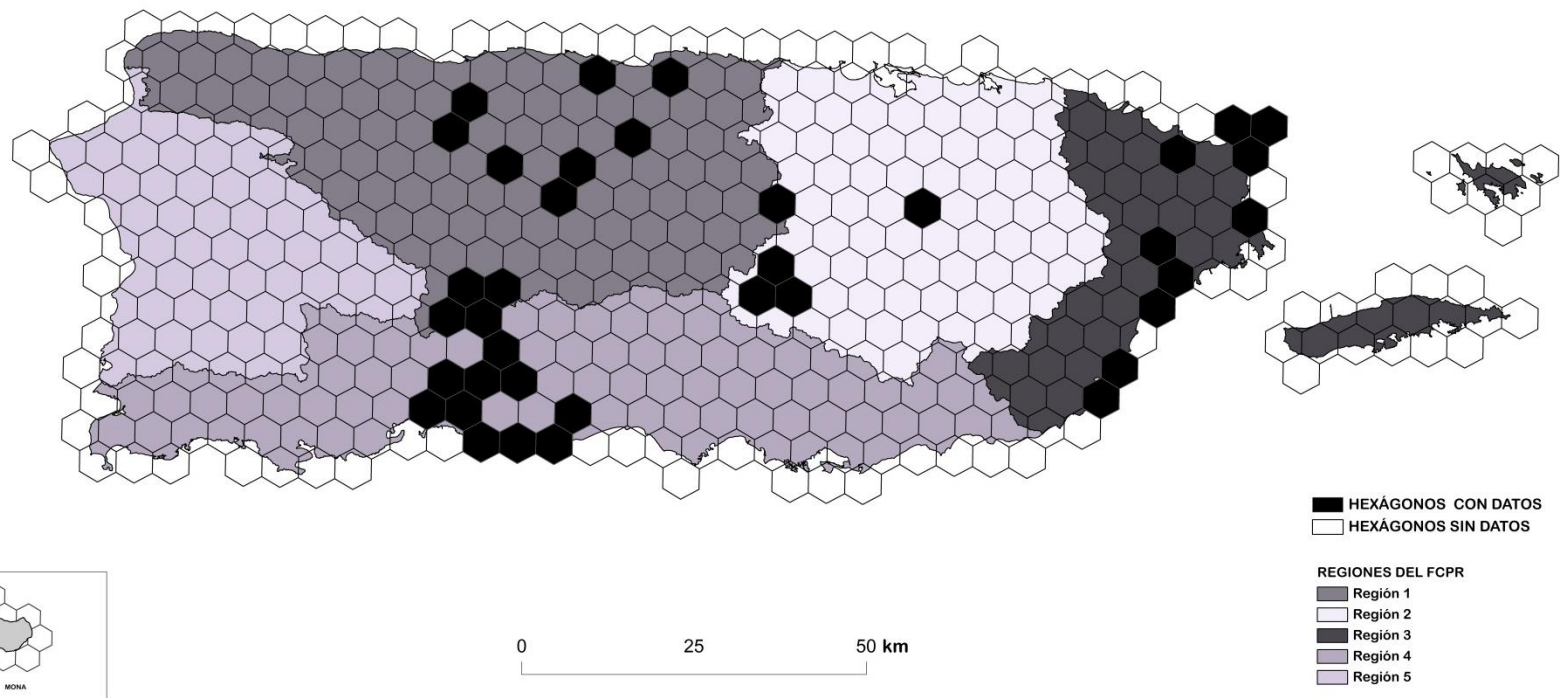




# Field Activities







**Goal : Cover 25% of Puerto Rico in five years**

# Volunteer Leader Program



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# Theory Workshop



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# Field Component



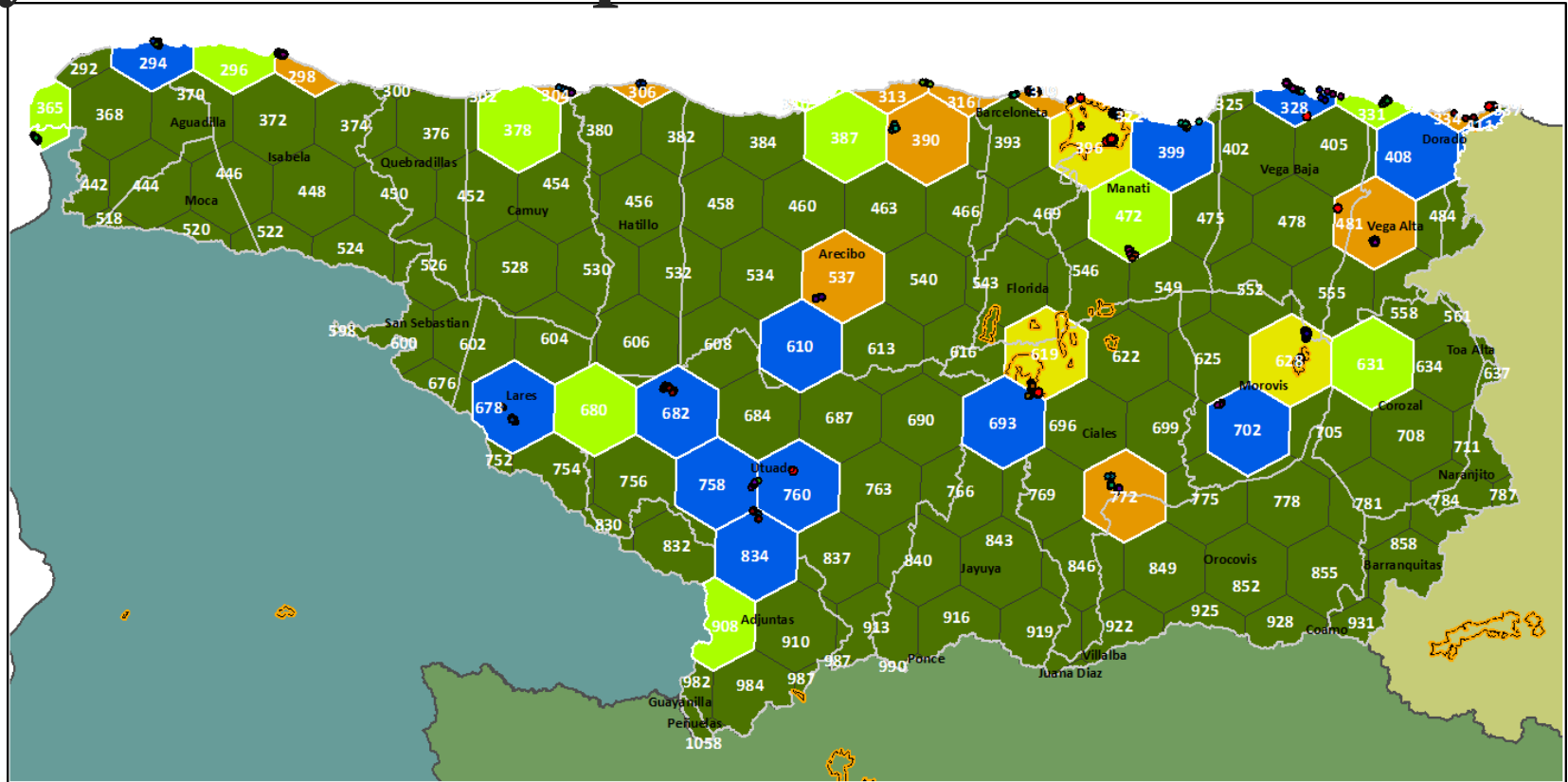
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# Hexágonos 2011-2013

## Volunteer Leaders

## y Hacienda la Esperanza



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# eBird



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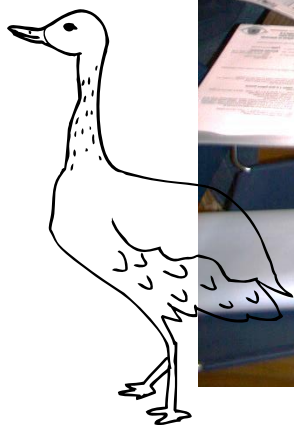
# pajareando con sentido



Tours on bird observations

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**1,318 MAESTROS**

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# SIGN UP TODAY!

www.ebird.org/pr

Puerto Rico eBird Submit Observations Explore Data My eBird Help & Info Yogani Govender (yoganig) Sign Out Language

1 2 3 Where did you bird?

Identify the location where you made your observations.

Select from "My Locations" Continue

Edit "My Locations" list

**Find it on a Map**  
Select existing personal locations and hotspots, or plot a new location.

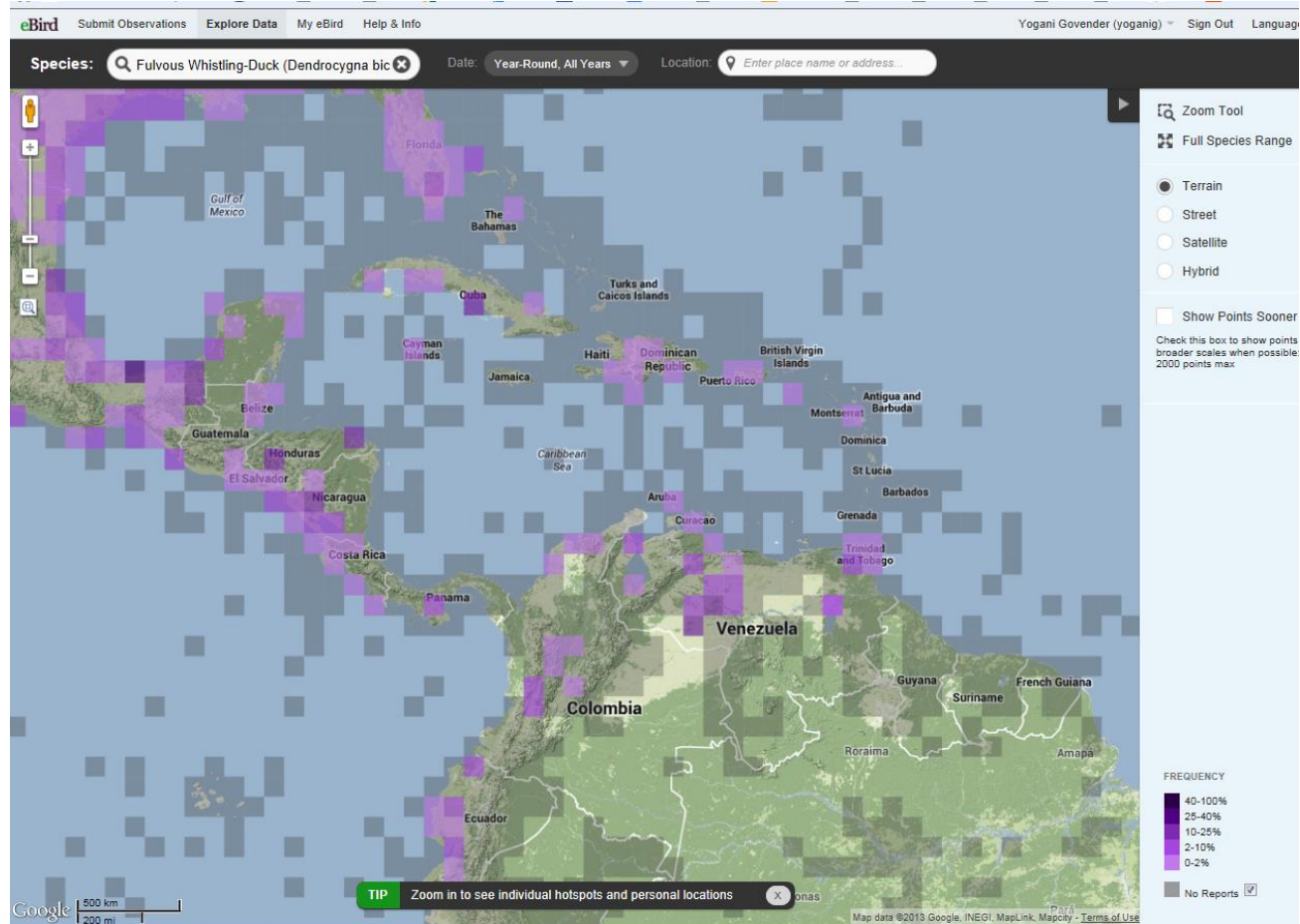
**Use Latitude/Longitude**  
Create a new location using latitude and longitude.

**Select an entire city, county, or state**  
If you were birding across a very large area (e.g., an entire state, county, or city) select this option. Please consider using more precise locations when reporting to eBird so that your observations are more valuable for analysis.

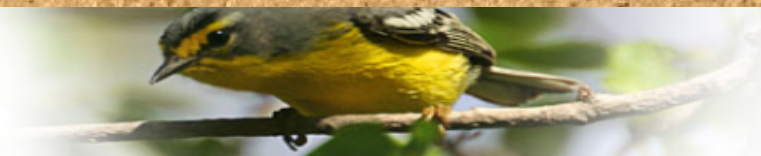
**Import Data**  
Import data from a spreadsheet, database, or birding program. [Learn how](#)

© Cornell Lab of Ornithology | Contact | FAQ

# A Conservation Tool







Hello Yogani Govender (yoganig) | [Preferences](#) | [Sign Out](#)

Translate to: [English](#) | [Español](#)

[« Start Over](#)

## Bird Observations

Date Range:

1/1 - 12/31, 1900-2013 **Combine Years**

▼ For   
[ [Culebra](#) ]

119 species (+2 other taxa)

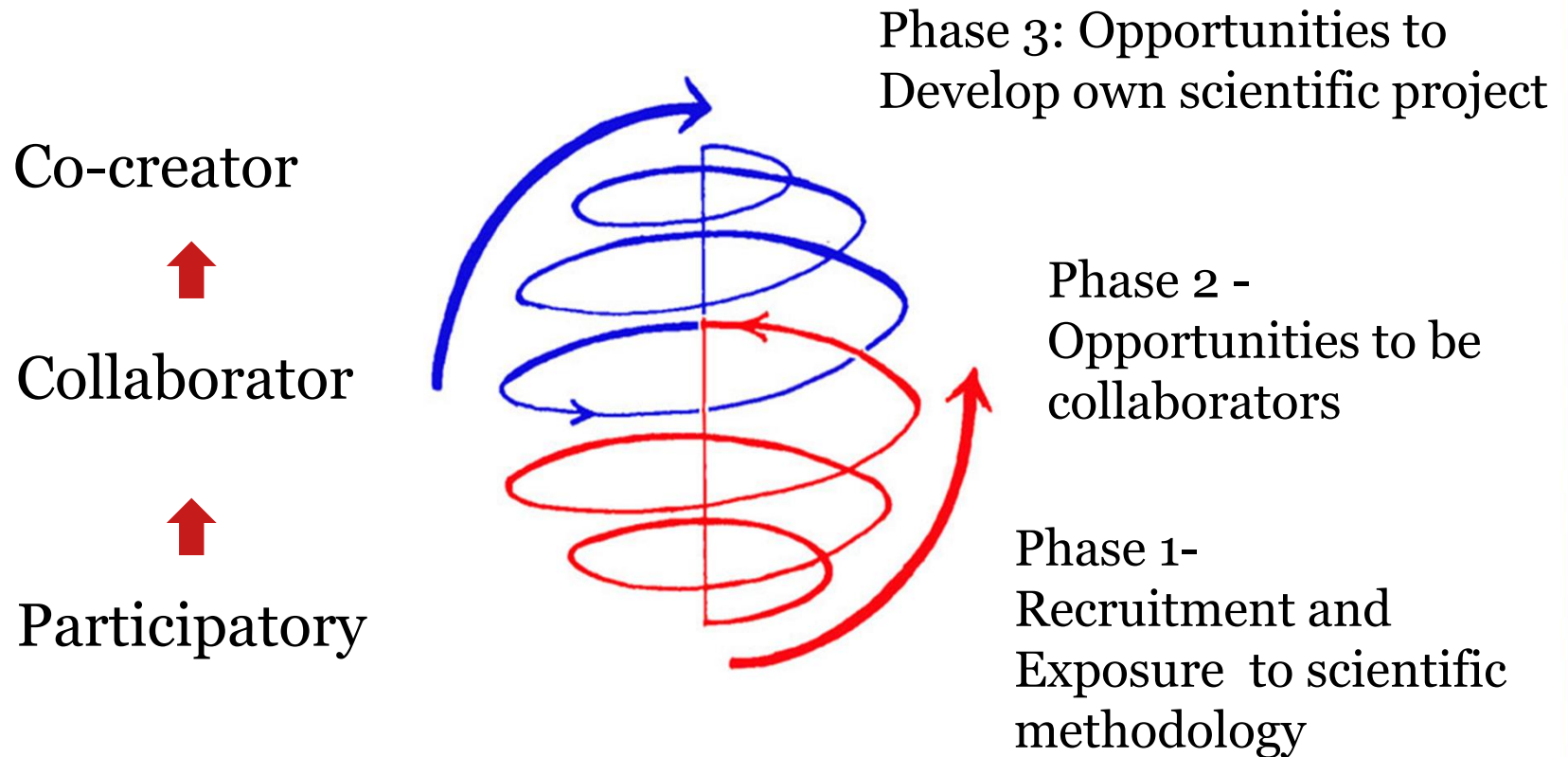
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<a href="#">Mallard (<i>Anas platyrhynchos</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Blue-winged Teal (<i>Anas discors</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">White-cheeked Pintail (<i>Anas bahamensis</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Lesser Scaup (<i>Aythya affinis</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Ruddy Duck (<i>Oxyura jamaicensis</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Helmeted Guineafowl (<i>Numida meleagris</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Red Junglefowl (<i>Gallus gallus</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Indian Peafowl (<i>Pavo cristatus</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Least Grebe (<i>Tachybaptus dominicus</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Pied-billed Grebe (<i>Podilymbus podiceps</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">American Flamingo (<i>Phoenicopterus ruber</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Audubon's Shearwater (<i>Puffinus lherminieri</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">White-tailed Tropicbird (<i>Phaethon lepturus</i>)</a>	<input type="button" value="MAP"/>												
<a href="#">Red-billed Tropicbird (<i>Phaethon</i></a>	<input type="button" value="MAP"/>												

# **Value of Citizen Science**

- **Migratory Birds**
- **Endangered Birds**
- **Bird Atlas of Puerto Rico**



# Model for ISE-CAISE





**CIUDADANO CIENTÍFICO**

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# NSF Citizen Science Puerto Rico Phase 1

- \$1M ISE-NSF award
  - 2-year project
  - HLE project site
  - 6 ecologic projects for management purposes
  - 5,000 citizen engagement goal
- Six Research Themes
    - Bats
    - Birds
    - Sedimentology
    - Plants
    - Archaeology
    - Crabs
- Co-creator
- Collaborator
- Participatory**





**Arqueología**



**Aves**



**Botánica**



**Costas**



**Jueyes**



**Murcielágos**



**CIUDADANO CIENTÍFICO | INVESTIGACIONES**

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# Achievement NSF Citizen Science Phase 1

- Activities: 600
- Participants: 2,322
- Recurrent participants: 1,106 (48%)
- One-time & recurrent participations: 5,781
- Volunteer hours: 21,000
- 55 volunteers have had double digit repeat participation
- Ranging between 10 and 88 participations; one volunteer had 115



# NSF Citizen Science Puerto Rico Phase 2

Investigación de proceso educativo

Arqueología

Aves

Murciélagos

Río

Sedimento

Evaluaciones  
internas y  
externas

Participantes  
regulares

Participantes  
medulares



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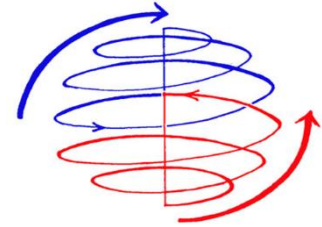


## Research Objectives

- To learn if the proposed ISE model generates a gain in knowledge and skills, and change in attitude and behavior of participants that become co-creative citizen scientists.
- To explore STEM pedagogy with Hispanic populations in ISE settings, including how scientists' behavior and communication shifts according to participant profile and environmental settings; scientists' gain from the ISE experience; and scientists' commitment to further advance ISE.



# ISE Model



- Education
  - We want to know what the are skills, attitudes, behavior and knowledge changes that occur in volunteers
  - We want to know what the are skills, attitudes, behavior and knowledge changes that occur in the scientists
  - We want to know the success of Informal Science Education in the wider pedagogic framework





## Lesson Learned Thus Far

- Motivated and passionate
- High level of engagement
- Actively supporting participants (asking questions, data collection, engaging participants on process)
- Take ownership
- Strong alignment between facilitators created a collaborative atmosphere
- Logistics were handled very well
- <http://bd.paralanaturaleza.info/>

# To improve

## – Participants

- Overall purpose of research project in relation to Citizen Science was inconsistent throughout the projects
- Facilitators were inconsistent in explaining the overall goal of the CC project.
- **Facilitators (researchers, assistants and interpreters)**
- Participant's knowledge gap
- Recruitment and sustaining participation
- Program Logistics (paperwork) (but participants did not express concern)



**APRENDE**

**PROTEGE**

**DISFRUTA**

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